

Practitioner's Docket No. LAR 15908-1

## PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Garnett C. Horner et al, John E. Teter, William E. Robbins, and Benjamin M. Copeland  
Application No.: 09/932,872  
Filed: August 17, 2001  
For: Piezoelectric Composite Device And Method For Making Same

Examiner: J. Aguirrechea  
Art Unit: 2834

Assistant Commissioner for Patents  
Washington, D.C. 20231

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TECHNOLOGY CENTER 2800

CERTIFICATE OF FACSIMILE

I hereby certify that the correspondence detailed below is being transmitted via facsimile to Technology Center 2800, 703-872-9318, Attn: Jaydi A. Aguirrechea, in care of the Commissioner of Patents and Trademarks, Washington, D.C. 20231 on the date shown below.

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3/3/03  
Date

Elaine C. McMahon  
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RESPONSE TO RESTRICTION REQUIREMENT

Responsive to the Office Action mailed February 11, 2003, in which action a requirement for restriction was made under 35 U.S.C. § 121, the Applicants respond as follows:

1. Applicants elect to prosecute claims 22-42 for examination.
2. Applicants withdraw claims 1-21 from consideration.
3. This election is made without traverse.
4. Although claims 1-21 are withdrawn from further consideration as directed to a non-elected invention, the Applicants reserve the right to file a divisional application thereon.
5. A summary document with the status of all claims and the text of all pending claims is attached.

Respectfully submitted,

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**SUMMARY DOCUMENT SHOWING STATUS OF CLAIMS**

Claims 1-21 (Withdrawn).

22. (Original) : An apparatus comprising:  
a piezoelectric wafer having a first electroded surface and a second electroded side opposite to said first electroded surface;  
a first electrically conductive ribbon lead positioned over and in electrical contact with the first electroded surface of the piezoelectric wafer;  
a second electrically conductive ribbon lead positioned over and in electrical contact with the second electroded surface of the piezoelectric wafer; and  
a layer of curable, electrically non-conductive material, the layer of material surrounding the piezoelectric wafer and the first and second electrically conductive ribbon leads, the layer of curable, electrically non-conductive material having a coefficient of thermal expansion that is substantially greater than the coefficient of thermal expansion of the piezoelectric wafer, the layer of curable, electrically non-conductive material compressing the piezoelectric wafer to such a degree that the piezoelectric wafer becomes highly flexible.
23. (Original) : The apparatus according to claim 22 wherein the first electroded surface comprises a thin surface deposit of nickel.
24. (Original) : The apparatus according to claim 22 wherein the second electroded surface comprises a thin surface deposit of nickel.
25. (Original) : The apparatus according to claim 22 wherein the first electrically conductive lead is made of nickel.
26. (Original) : The apparatus according to claim 22 wherein the second electrically conductive lead is made of nickel.
27. (Original) : The apparatus according to claim 22 wherein the layer of curable, electrically non-conductive film is a thermoplastic polyimide.

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28. (Original) : The apparatus according to claim 22 wherein the piezoelectric wafer is made of lead zirconate titanate.

29. (Original) : An apparatus comprising:

a piezoelectric wafer having a first electroded surface and a second electroded side opposite to said first electroded surface;

a first electrically-conductive ribbon lead positioned over and in electrical contact with the first electroded surface of the piezoelectric wafer;

a second electrically-conductive ribbon lead positioned over and in electrical contact with the second electroded surface of the piezoelectric wafer; and

a layer of curable, electrically non-conductive material, the layer of material surrounding the piezoelectric wafer and the first and second electrically conductive ribbon leads, the layer of curable, electrically non-conductive material having a coefficient of thermal expansion that is substantially greater than the coefficient of thermal expansion of the piezoelectric wafer, the layer of curable, electrically non-conductive material compressing the piezoelectric wafer to such a degree that the piezoelectric wafer becomes capable of being wrapped around a highly curved surface.

30. (Original) : The apparatus according to claim 29 wherein the first electroded surface comprises a thin surface deposit of nickel.

31. (Original) : The apparatus according to claim 29 wherein the second electroded surface comprises a thin surface deposit of nickel.

32. (Original) : The apparatus according to claim 29 wherein the first electrically conductive lead is made of nickel.

33. (Original) : The apparatus according to claim 29 wherein the second electrically conductive lead is made of nickel.

34. (Original) : The apparatus according to claim 29 wherein the layer of curable, electrically non-conductive film is a thermoplastic polyimide.

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35. (Original) : The apparatus according to claim 29 wherein the piezoelectric wafer is made of lead zirconate titanate.

36. (Original) : An apparatus comprising:  
a piezoelectric wafer having a first electroded surface and a second electroded side opposite to said first electroded surface;  
a first electrically-conductive ribbon lead positioned over and in electrical contact with the first electroded surface of the piezoelectric wafer;  
a second electrically-conductive ribbon lead positioned over and in electrical contact with the second electroded surface of the piezoelectric wafer; and  
a layer of curable, electrically non-conductive material, the layer of material surrounding the piezoelectric wafer and the first and second electrically conductive ribbon leads, the layer of curable, electrically non-conductive material having a coefficient of thermal expansion that is substantially greater than the coefficient of thermal expansion of the piezoelectric wafer, the layer of curable, electrically non-conductive material compressing the piezoelectric wafer to such a degree that the piezoelectric wafer is capable of being sharply bent.

37. (Original) : The apparatus according to claim 37 wherein the first electroded surface comprises a thin surface deposit of nickel.

38. (Original) : The apparatus according to claim 37 wherein the second electroded surface comprises a thin surface deposit of nickel.

39. (Original) : The apparatus according to claim 37 wherein the first electrically conductive lead is made of nickel.

40. (Original) : The apparatus according to claim 37 wherein the second electrically conductive lead is made of nickel.

41. (Original) : The apparatus according to claim 37 wherein the layer of curable, electrically non-conductive film is a thermoplastic polyimide.

42. (Original) : The apparatus according to claim 37 wherein the piezoelectric wafer is made of lead zirconate titanate.